

United States Patent Application for

**E-Z SHUTTER CRANK**

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## E-Z SHUTTER CRANK

This invention relates to windows and storm shutters and in particular to an extension rod tool devices and methods of use to allow power tools and socket wrenches to automatically open a close existing elevated window type shutters that have T shaped  
5 and crossed pins in their crank knob.

### BACKGROUND AND PRIOR ART

Elevated window and storm shutters are known to have built in shutter cranks that require long extended hand crank arms, that require a user to grip the shutter crank,  
10 and manually rotate the long extended arm to open and close the shutters. The manual action can be both tedious, time consuming, and difficult to most users. As a result, often the hand crank arms are not used, and the shutters remain in either constantly open or closed positions.

Various tools have been proposed over the years that can be attached to and be  
15 used for extending the reach of power tools. See for example, U.S. Patents 1,765,362 to Berry; 3,011,813 to Arneson; 4,357,845 to Cornia; Des. 358,082 to Trezza; 6,171,033 to Wrobel; 6,382,885 to Isaksson; and 6,558,089 to DeBlasio. However, none of these devices has been described for use with crank arms on shutters and windows. In addition, these patented devices would not be able to be used with T-shaped control knobs used on  
20 elevated shutter type windows.

U.S. Patent 4,984,489 to Krauthamer describes a "window handle turning accessory", title, that can attach to a power drill. However, this device requires an enlarged cylindrical housing with a rear conical section that is separately attached to a smaller diameter shank, the latter of which is attached to the power tool, Figures 2, 3, 4.  
25 The accessory has one long side slit 30/31 Fig. 2, or two opposite long side slits 52, 54 for fitting over, a round handle knob, Fig. 3 or over a double wing(butterfly) knob, Fig. 4.

Other enlarged heads in the remaining figures having cylindrical openings that fit over cylindrical splined portions of window handles, Figures 5-9.

The Krauthamer accessories would require the user loosely fit the enlarged heads of the accessory over the knobs without locking the knob to the accessory. Thus, the  
5 Krauthamer accessories can potentially disengage and fall off the knobs during use.

Furthermore, the Krauthamer accessories would not be practical or easy or inexpensive to manufacture due to the enlarged head which must require separate machining and molding before it can be attached to a shank for use with a power tool.

In addition, the Krauthamer accessories would not be able to be used with cross  
10 positioned and T-shaped pins that are used on cranks of elevated window shutters since their heads would not fit thereon, and would not be able to lock onto T-shaped pins on the cranks of elevated window shutters. Furthermore, the short shank lengths in the Krauthamer accessories are not long enough to be used with elevated shutter windows.

Thus, the need exists for solutions to the problems with the prior art.  
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### SUMMARY OF THE INVENTION

A primary objective of the present invention is to provide an extension rod tool and method of using the extension rod tool with power drills and power screw drivers, that can automatically crank open and crank closed an elevated window type shutter  
20 having a crank handle having cross shaped and T-shaped pins

A secondary objective of the present invention is to provide an extension rod tool and method of using the extension rod tool with power drills and power screw drivers, that can automatically lock onto and easily be released from crank handles having cross shaped and T-shaped pins used on elevated window type shutters.

25 A third objective of the present invention is to provide an extension rod tool and method of using the extension rod tool with elevated window type shutters having a crank

handle having cross shaped and T-shaped pins, that is inexpensive to manufacture and use.

Embodiments of the invention can include novel rod shaped members having a flat sided end such as a hexagon shaped perimeter end that can be inserted into an adjustable chuck head of a conventional power tool(battery, cordless or powercord), such as a electric drill, electric screw driver, and the like. The opposite end of the novel rod shaped member can include an adapter head end having an opening with opposite facing slit slots so that the adapter end can fit over a tip of a window/shutter crank handle and existing sideway protruding pins on the crank handle can pass through the side slits and lock into curved slots by rotating the rod shaped member.

A first embodiment can have a pair of clockwise oriented curved slots on opposite sides of the rod shaped member having a lower case b-shaped configuration. Twisting the rod counter-clockwise locks the rod to the crank handle.

A second embodiment can have a pair of counter-clockwise oriented curved slots on opposite sides of the rod shaped member having a backward lower case b-shaped configuration. Twisting the rod clockwise locks the rod to the crank handle.

A third embodiment can have a pair of t-shaped curved slots on opposite sides of the rod shaped member. Twisting the rod either clockwise or counter clockwise locks the rod to the crank handle.

A fourth embodiment can have a pair of oval shaped curved slots on opposite sides of the rod shaped member. Twisting the rod either clockwise or counter clockwise locks the rod to the crank handle.

The rod members can be easily removed by slightly twisting the rod members and pulling the rod members from the crank handle.

Further objects and advantages of this invention will be apparent from the following detailed description of the presently preferred embodiments which are illustrated schematically in the accompanying drawings.

BRIEF DESCRIPTION OF THE FIGURES

Fig. 1 is a perspective right side view of a first preferred embodiment of a crank extension rod with flat sided tool head end and crank end having clockwise oriented curved slots.

Fig. 2A is a right side view of the crank extension rod of Fig. 1.

5 Fig. 2B is a top side view of the crank extension rod of Fig. 2A along arrow 2B.

Fig. 2C is a left side view of the crank extension rod of Fig. 2B along arrow 2C.

Fig. 2D is a bottom side view of the crank extension rod of Fig. 2C along arrow 2D.

Fig. 2E is a rear end view of the crank extension rod of Fig. 2A along arrow 2E.

Fig. 2F is a front end view of the crank extension rod of Fig. 2A along arrow 2F.

10 Fig. 3A is a perspective view of the crank extension rod of the preceding figures separated from a power tool.

Fig. 3B is another view of the crank extension rod of the preceding figures attached to the power tool.

15 Fig. 4A shows the power tool with attached crank extension rod of Fig. 3B about to be attached to crank handle on a window/shutter.

Fig. 4B is an enlarged view of Fig. 4A showing the crank extension rod about to be attached to the perpendicular pins on the crank handle of the window/shutter.

Fig. 5A shows the power tool with attached crank extension rod of the preceding figures positioned attached to the perpendicular pins on the crank handle of the window/shutter.

20 Fig. 5B is an enlarged view of Fig. 5A showing the crank extension rod attached to the perpendicular pins on the crank handle of the window/shutter.

Fig. 6 is a perspective right side view of a second preferred embodiment of a crank extension rod with flat sided tool head end and crank end having counter-clockwise oriented curved slots.

25 Fig. 7A is a right side view of the crank extension rod of Fig. 6.

Fig. 7B is a top side view of the crank extension rod of Fig. 7A along arrow 2B.

Fig. 7C is a left side view of the crank extension rod of Fig. 7B along arrow 7C.

Fig. 7D is a bottom side view of the crank extension rod of Fig. 7C along arrow 7D.

Fig. 7E is a rear end view of the crank extension rod of Fig. 7A along arrow 7E.

Fig. 7F is a front end view of the crank extension rod of Fig. 7A along arrow 7F.

Fig. 8A is an enlarged view of a power tool attached crank rod of the second embodiment

5 about to be attached to the crank handle of the window/shutter.

Fig. 8B is another view of Fig. 8A with the crank rod attached to the crank handle.

Fig. 9 is a perspective right side view of a third preferred embodiment of a crank extension rod with flat sided tool head end and crank end having t-shaped curved slots.

Fig. 10A is a right side view of the crank extension rod of Fig. 9.

10 Fig. 10B is a top side view of the crank extension rod of Fig. 10A along arrow 10B.

Fig. 10C is a left side view of the crank extension rod of Fig. 10B along arrow 10C.

Fig. 10D is a bottom side view of the crank extension rod of Fig. 10C along arrow 10D.

Fig. 10E is a rear end view of the crank extension rod of Fig. 10A along arrow 10E.

Fig. 10F is a front end view of the crank extension rod of Fig. 10A along arrow 10F.

15 Fig. 11A is an enlarged view of a power tool attached crank rod of the third embodiment about to be attached to the crank handle of the window/shutter.

Fig. 11B is another view of Fig. 11A with the crank rod attached to the crank handle.

Fig. 12 is a perspective right side view of a fourth preferred embodiment of a crank extension rod with flat sided tool head end and crank end having oval-shaped curved

20 slots.

Fig. 13A is a right side view of the crank extension rod of Fig. 12.

Fig. 13B is a top side view of the crank extension rod of Fig. 13A along arrow 13B.

Fig. 13C is a left side view of the crank extension rod of Fig. 13B along arrow 13C.

Fig. 13D is a bottom side view of the crank extension rod of Fig. 13C along arrow 13D.

25 Fig. 13E is a rear end view of the crank extension rod of Fig. 13A along arrow 13E.

Fig. 13F is a front end view of the crank extension rod of Fig. 13A along arrow 13F.

### DESCRIPTION OF THE PREFERRED EMBODIMENTS

Before explaining the disclosed embodiments of the present invention in detail it is to be understood that the invention is not limited in its applications to the details of the particular arrangements shown since the invention is capable of other embodiments.

5 Also, the terminology used herein is for the purpose of description and not of limitation.

#### FIRST EMBODIMENT

Fig. 1 is a perspective right side view of a first preferred embodiment of a crank extension rod 1 with flat sided tool head end 40 and crank end 20 having clockwise oriented curved slots 22, 24, 26, 28. Fig. 2A is a right side view of the crank extension rod 1 of Fig. 1. Fig. 2B is a top side view of the crank extension rod 1 of Fig. 2A along arrow 2B. Fig. 2C is a left side view of the crank extension rod 1 of Fig. 2B along arrow 2C. Fig. 2D is a bottom side view of the crank extension rod 1 of Fig. 2C along arrow 2D. Fig. 2E is a rear end view of the crank extension rod 1 of Fig. 2A along arrow 2E. Fig. 2F is a front end view of the crank extension rod 1 of Fig. 2A along arrow 2F.

Referring to Figures 1-2F, extension rod 1 can include a cylindrical tubular portion 10 having a length of approximately 12 to approximately 18 inches or greater and a tubular diameter of approximately  $\frac{1}{2}$  inch to approximately 1 inch. Extending from a front end 30 of the cylindrical mid portion 10 of extension rod 1 can be a narrower diameter protruding portion 40 having flat sides 42 that can have a hexagon perimeter shape. The opposite end 20 of the cylindrical tubular portion 10 can include a hollowed out opening 25 and a pair of oppositely facing clockwise oriented curved cut-out slots 22, 24, 26, 28 in the sides of cylindrical tubular portion 10 that can each have a generally lower case b-shape configuration. The slot width openings can be approximately  $\frac{3}{16}$  of an inch for a tight fit, and up to approximately  $\frac{1}{4}$  inch for a loose fit.

Fig. 3A is a perspective view of the crank extension rod 1 of the preceding figures separated from and about to be moved in the direction of arrow X to the adjustable head

of a power tool 50. Fig. 3B is another view of the crank extension rod 1 of the preceding figures attached to the power tool 50. A conventional handheld power tool 50 such as but not limited to an electrical power drill, a power screw driver, and the like, having an adjustable chuck head 55 can be used to lock about the flat sided faces 42 of the protruding portion 40 of the novel extension rod 1.

Fig. 4A shows the power tool 50 with attached crank extension rod 1 of Fig. 3B about to be attached to a conventional crank handle 70 on a window/shutter 60. Fig. 4B is an enlarged view of Fig. 4A showing the crank extension rod 1 about to be attached to the perpendicular pins 76 on the crank handle 70 of the window/shutter 60. The pins 76 in this conventional crank handle 70 are generally perpendicular to shaft portion 74 forming a generally T-shaped configuration. The shaft portion 74 can be attached by a pivot member to a base 72 that can rotate within a stationary base 71 in the crank handle 70. Fig. 5A shows the power tool 50 with attached crank extension rod 1 of the preceding figures after being slipped over the tip 78 and perpendicular pins 76 on the crank handle 70 of the window/ shutter 60. Fig. 5B is an enlarged view of Fig. 5A showing the crank extension rod 1 attached to and locked onto the pins 76 on the crank handle 70 of the window/shutter 60.

Referring to Figures 1-5B, opening 25 of end 20 of extension rod 1 can be moved in the direction of arrow I1 to slip over tip portion 78 of crank handle 70 and allow pins 76 to pass through the vertical slot cut-out portions 22, 26 in the end 20 of the rod 1 until the pins 76 abut against wall portions in the horizontal slot cut-out portions 24, 28. The extension rod 1 is then locked to the pins 76 of the crank handle 70 by twisting the extension rod in a counter-clockwise direction as shown by arrow R1 until the pins 76 abut against other wall portions in the slots. A user can then turn on the power tool 50 to rotate in a counter clockwise direction allowing the shaft 74 of the crank handle 70 to open the shutter/window 60. To close the shutter/window 60, the power tool 50 can be switched to rotate the rod 1 in a clockwise direction allowing the shutter/window to be



closed. When finished the user can easily twist the rod 1 by the power tool 50 to pull off and remove the rod 1 from the crank handle 70.

## SECOND EMBODIMENT

5            Fig. 6 is a perspective right side view of a second preferred embodiment of a crank extension rod 100 with flat sided tool head end 140 and crank end 120 having counter-clockwise oriented curved slots 122, 124, 126, 128. Fig. 7A is a right side view of the crank extension rod 100 of Fig. 6. Fig. 7B is a top side view of the crank extension rod 100 of Fig. 7A along arrow 2B. Fig. 7C is a left side view of the crank extension rod 100 of Fig. 7B along arrow 7C. Fig. 7D is a bottom side view of the crank extension rod 100 of Fig. 7C along arrow 7D. Fig. 7E is a rear end view of the crank extension rod 100 of Fig. 7A along arrow 7E. Fig. 7F is a front end view of the crank extension rod 100 of Fig. 7A along arrow 7F.

            Referring to Figures 6-7F, the second embodiment crank rod 100 can include a cylindrical tubular portion 110 having a length of approximately 12 to approximately 18 inches or greater and a tubular diameter of approximately  $\frac{1}{2}$  inch to approximately 1 inch. Extending from a front end 130 of the cylindrical mid portion 110 of extension rod 100 can be a narrower diameter protruding portion 140 having flat sides 142 that can have a hexagon perimeter shape. The opposite end 120 of the cylindrical tubular portion 110 can include a hollowed out opening 125 and a pair of oppositely facing counter-clockwise oriented curved cut-out slots 122, 124, 126, 128 in the sides of cylindrical tubular portion 110 that can each have a generally lower case backward b-shape configuration. The slot width openings can be approximately  $\frac{3}{16}$  of an inch for a tight fit, and up to approximately  $\frac{1}{4}$  inch for a loose fit.

25            Fig. 8A is an enlarged view of a power tool attached crank rod 100 of the second embodiment about to be attached to the crank handle 70 of the window/shutter. Fig. 8B is another view of Fig. 8A with the crank rod 100 attached to the crank handle 70.

Referring to Figures 6-8B, a power tool 50 (such as that shown in Figures 3A-3B) can be attached to the protruding portion 140 in a manner similar to the first embodiment described above.

Next, opening 125 of end 120 of extension rod 100 can be moved in the direction of arrow I2 to slip over tip portion 78 of crank handle 70 and allow pins 76 to pass through the vertical slot cut-out portions 122, 126 in the end 120 of the rod 100 until the pins 76 abut against a wall portion in the horizontal slot cut-out portions 124, 128. The extension rod 100 is then locked to the pins 76 of the crank handle 70 by twisting the extension rod in a clockwise direction as shown by arrow R2 until the pins 76 abut against another wall portion in the slots. A user can then turn on the power tool 50 to rotate in a clockwise direction allowing the shaft 74 of the crank handle 70 to close the shutter/window 60 (shown in Figures 4A, 5A). To open the shutter/window 60, the power tool 50 can be switched to rotate the rod 1 in a counter-clockwise direction allowing the shutter/window to be opened. When finished the user can easily twist the rod 100 by the power tool 50 to pull off and remove the rod 100 from the crank handle 70.

### THIRD EMBODIMENT

Fig. 9 is a perspective right side view of a third preferred embodiment of a crank extension rod 200 with flat sided tool head end 240 and crank end 220 having t-shaped curved slots 222, 224, 226, 228. Fig. 10A is a right side view of the crank extension rod 200 of Fig. 9. Fig. 10B is a top side view of the crank extension rod 200 of Fig. 10A along arrow 10B. Fig. 10C is a left side view of the crank extension rod 200 of Fig. 10B along arrow 10C. Fig. 10D is a bottom side view of the crank extension rod 200 of Fig. 10C along arrow 10D. Fig. 10E is a rear end view of the crank extension rod 200 of Fig. 10A along arrow 10E. Fig. 10F is a front end view of the crank extension rod 200 of Fig. 10A along arrow 10F.

Referring to Figures 9-10F, the third embodiment crank rod 200 can include a cylindrical tubular portion 210 having a length of approximately 12 to approximately 18 inches or greater and a tubular diameter of approximately  $\frac{1}{2}$  inch to approximately 1 inch. Extending from a front end 230 of the cylindrical mid portion 210 of extension rod 200  
5 can be a narrower diameter protruding portion 240 having flat sides 242 that can have a hexagon perimeter shape. The opposite end 220 of the cylindrical tubular portion 210 can include a hollowed out opening 225 and a pair of oppositely facing t-shaped curved cut-out slots 222, 224, 226, 228 in the sides of cylindrical tubular portion 210. The slot width openings can be approximately  $\frac{3}{16}$  of an inch for a tight fit, and up to approximately  $\frac{1}{4}$   
10 inch for a loose fit.

Fig. 11A is an enlarged view of a power tool attached crank rod 200 of the third embodiment about to be attached to the crank handle 70 of the window/shutter 60. Fig. 11B is another view of Fig. 11A with the crank rod 200 attached to the crank handle 70. Referring to Figures 9-11B, a power tool 50 (such as that shown in Figures 3A-3B) can be  
15 attached to the protruding portion 240 in a manner similar to the first embodiment described above.

Next, opening 225 of end 220 of extension rod 200 can be moved in the direction of arrow I3 to slip over tip portion 78 of crank handle 70 and allow pins 76 to pass through the vertical slot cut-out portions 222, 226 in the end 220 of the rod 200 until the  
20 pins 76 abut against a wall portion in the horizontal slot cut-out portions 224, 228. The extension rod 200 is then locked to the pins 76 of the crank handle 70 by twisting the extension rod in a counter-clockwise direction as shown by arrow R1 or in a clockwise direction as shown by arrow R2 until the pins 76 abut against other wall portions in the slots. A user can then turn on the power tool 50 to rotate in a clockwise direction  
25 allowing the shaft 74 of the crank handle 70 to close the shutter/window 60 (shown in Figures 4A, 5A). To open the shutter/window 60, the power tool 50 can be switched to rotate the rod 1 in a counter-clockwise direction allowing the shutter/window to be

opened. When finished the user can easily twist the rod 200 by the power tool 50 to pull off and remove the rod 200 from the crank handle 70.

#### FOURTH EMBODIMENT

5            Fig. 12 is a perspective right side view of a fourth preferred embodiment of a crank extension rod 300 with flat sided tool head end 340 and crank end 320 having oval-shaped curved slots 322, 324, 326, 328. Fig. 13A is a right side view of the crank extension rod 300 of Fig. 12. Fig. 13B is a top side view of the crank extension rod 300 of Fig. 13A along arrow 13B. Fig. 13C is a left side view of the crank extension rod 300 of Fig. 13B along arrow 13C. Fig. 13D is a bottom side view of the crank extension rod 300 of Fig. 13C along arrow 13D. Fig. 13E is a rear end view of the crank extension rod 300 of Fig. 13A along arrow 13E. Fig. 13F is a front end view of the crank extension rod 300 of Fig. 13A along arrow 13F.

          Referring to Figures 12-13F, the fourth embodiment crank rod 300 can include a  
15    cylindrical tubular portion 310 having a length of approximately 12 to approximately 18 inches or greater and a tubular diameter of approximately  $\frac{1}{2}$  inch to approximately 1 inch. Extending from a front end 330 of the cylindrical mid portion 310 of extension rod 300 can be a narrower diameter protruding portion 340 having flat sides 342 that can have a hexagon perimeter shape. The opposite end 320 of the cylindrical tubular portion 310 can  
20    include a hollowed out opening 325 and a pair of oppositely facing oval shaped curved cut-out slots 326, 328 having stem cut-out portions 322, 324, in the sides of cylindrical tubular portion 310. The fourth embodiment can operate and function in a similar manner to the third embodiment described above. The slot width openings can be approximately  $\frac{3}{16}$  of an inch for a tight fit, and up to approximately  $\frac{1}{4}$  inch for a loose fit.

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While the invention has been described for use with window type shutters, the invention can be applicable to storm shutters, hurricane shutters, security shutters, safety shutters, rollup and roll down shutters, and the like.

5 The novel tool rod members can be formed from stainless steel, aluminum, plastic, combinations thereof, and the like. The tool rod can be formed from other materials such as plastics, graphite, composites, combinations thereof, and the like.

The novel tool rod members can be formed from a single cylindrical member with one end crimped into a shank portion for being attached to a power tool. Alternatively, the tool rod members can have other cross-sectional shape exteriors other than  
10 cylindrical, and can include square, rectangular, triangular, hexagon, and the like.

While the invention has been described for use with window type shutters, the invention can be applicable to storm shutters, hurricane shutters, security shutters, safety shutters, rollup and roll down shutters, and the like.

Although the preferred embodiments describe using the novel extension rod with  
15 power tools, the invention can be used with socket wrenches, and the like.

While the invention has been described, disclosed, illustrated and shown in various terms of certain embodiments or modifications which it has presumed in practice, the scope of the invention is not intended to be, nor should it be deemed to be, limited thereby and such other modifications or embodiments as may be suggested by the  
20 teachings herein are particularly reserved especially as they fall within the breadth and scope of the claims here appended.